

FAULT EVALUATION REPORT (FER-4)

March 18, 1976

1. Name of fault: Loma Linda fault
2. Location: Vicinity of Loma Linda, San Bernardino County; San Bernardino South and Redlands 7.5' quads (see Figure 1).
3. Reason for evaluation: Request by George Bartch, City Manager of Loma Linda (letter of January 16, 1976, attached) to amend Special Studies Zone.
4. List of references:
 - a) Charles Price and Michael Shea, February 16, 1976, Geologic and seismic evaluation, Tracts 9103, 9120, 9276, 9277, portion of "A" Tract, and "B" Tract, Loma Linda, California (for W.J. Engevick, W.J.E. Corporation, E.J. Miller and W.M. Stewart); with addendum letter of February 26, 1976 (summary of geologic and geophysical data on Loma Linda fault).
 - b) Leighton and Associates, August 31, 1971, Geologic/seismic report for Heritage General Hospital, Loma Linda, California.
 - c) Leighton and Associates, July 5, 1973, Geologic feasibility of Tract 8766, northwest corner of Benton Street and Lawton Ave., Loma Linda, California.
 - d) Earth Sciences Associates November 6, 1972, Loma Linda Tract 8517.
 - e) Woodward-McNeill and Associates, May 13, 1974, Fault study for San Bernardino County Flood Control District of proposed Scott Canyon Dam (Debris Dam #5), San Bernardino County, California.
 - f) Gary Rasmussen and Associates, December 4, 1975, Engineering geology investigation, Tentative Tract 9152, Lawton Ave., Loma Linda.

- g) Woodward-Lundgren & Associates, January 5, 1973, Geologic, seismic, and active fault investigation, Part A: Proposed Veterans Administration Hospital, Site No. 4, Loma Linda, California (on file at CDMG Headquarters).
- h) Pioneer Consultants, August 2, 1974, Geologic, seismic, and preliminary soils investigation, proposed addition to Linda Valley Convalescent Hospital, Loma Linda, California (on file at CDMG Headquarters).
- i) U.S. Geological Survey Aerial photos, 1952, GS-VR 9-24 to-27, black and white, scale 1:24,000 (approximately).
- j) Slosson, J.E., July 1, 1976, Special Studies Zones, Redlands and San Bernardino South quadrangles, Official Map of the State Geologist.
- k) Dutcher, L.C., and Garrett, A.A., 1963, Geologic and hydrologic features of the San Bernardino area, California; with special reference to underflow across the San Jacinto fault: U.S. Geological Survey Water-Supply Paper 1419, 113 p.
- l) Sharp, R.V., 1972, Map showing recently active breaks along the San Jacinto fault zone between the San Bernardino area and Borrego Valley, California: U.S. Geological Survey Miscellaneous Geologic Investigations Map 1-675.
- m) Sieh, K., and other, 1973, Geologic investigations of the San Jacinto fault zone, and aspects of the Socio-Economic Impact of earthquakes in the Riverside-San Bernardino area, California: University of California, Riverside, Campus Museum Contribution Number 3, 129 p., 8 pl.

5. Summary of available data:

The Loma Linda fault and the Special Studies Zone encompassing it are shown on Figure 2. The fault trace is based on the work of Dutcher and Garrett (1963) who portray it as inferred-concealed (groundwater barrier) in the alluvium and as approximately located in the Plio-Pleistocene beds exposed in the hills to the south. The Loma Linda fault was zoned on the basis of being a Quaternary fault -- the criterion for classifying a fault as potentially active. However, we could have (and probably should have) omitted the fault from our Official Maps inasmuch as Dutcher and Garrett (p. 40) clearly indicate that the younger alluvium and upper part of the older alluvium are unfaulted to a depth "considerably greater than 100 feet." Moreover, Sharp's (1972) map of the San Jacinto fault zone does not show any recently active fault in the vicinity of the Loma Linda fault.

Just prior to and since the establishment of the Special Studies Zones around this fault, a number of site investigations have been made (see references a-h and i) across the southern segment of the zone. These investigations include extensive trenching, airphoto interpretation, and geophysics (including seismic refraction, magnetic profiling, electrical resistivity, and gravity). These investigations are summarized by Price and Shea (1976), who conclude that the Loma Linda ^{fault} 1) may not be present within the investigated area, 2) if present, is covered by at least 100 feet of alluvium, and 3) is not thought to have been active in Holocene time. None of the reports (references a-h, ^{and i} ~~f~~) reviewed by me ~~indicate~~ indicate the presence of an active fault at or near the ground surface within the Loma Linda Special Studies Zones. Even the Plio-Pleistocene

units exposed to the southeast (SW 1/4 section 31) are not clearly cut by a through-going fault (Dutcher and Garrett, 1963; Woodward-McNeil, 1974).

6. Airphoto interpretation: Aerial photos of 1952 (reference i) were examined stereoscopically, but no recent fault features were identifiable. the only suggestive evidence of faulting was the NE-facing escarpment of "Hospital Hill" in SW $\frac{1}{4}$ section 25 (project). However, no soil or vegetation lineaments could be traced SE or NW of here. Further, no continuous or obvious NW-trending fault was observed in SW $\frac{1}{4}$ section 36 in the older rock units where a well-defined fault should have been observable.

7. Field observations: Not necessary, considering the amount of investigative field data available.

8. Conclusions: Based on the geologic data available (5 and 6 above), there appears to be no evidence of surface or near-surface faulting of the alluvium along the Loma Linda fault or in its vicinity following extensive investigations east of Loma Linda. Even Dutcher and Garrett, the source and basis for establishing the existing Special Studies Zone around the Loma Linda fault, indicate the Loma Linda fault to be a pre-recent feature. Thus, it is concluded that no substantiated evidence is known for the existence of an active (=Holocene) fault within the Special Studies Zone depicted in Figure 2.

9. Recommendation: Lacking evidence for the existence of a surface or near surface active fault anywhere along the Loma Linda fault, it is recommended that the Loma Linda fault and encompassing zone be deleted

from our Special Studies Zones maps.

10. Investigating geologist; date:

Earl W. Hart, 3/18/76

Earl W. Hart



